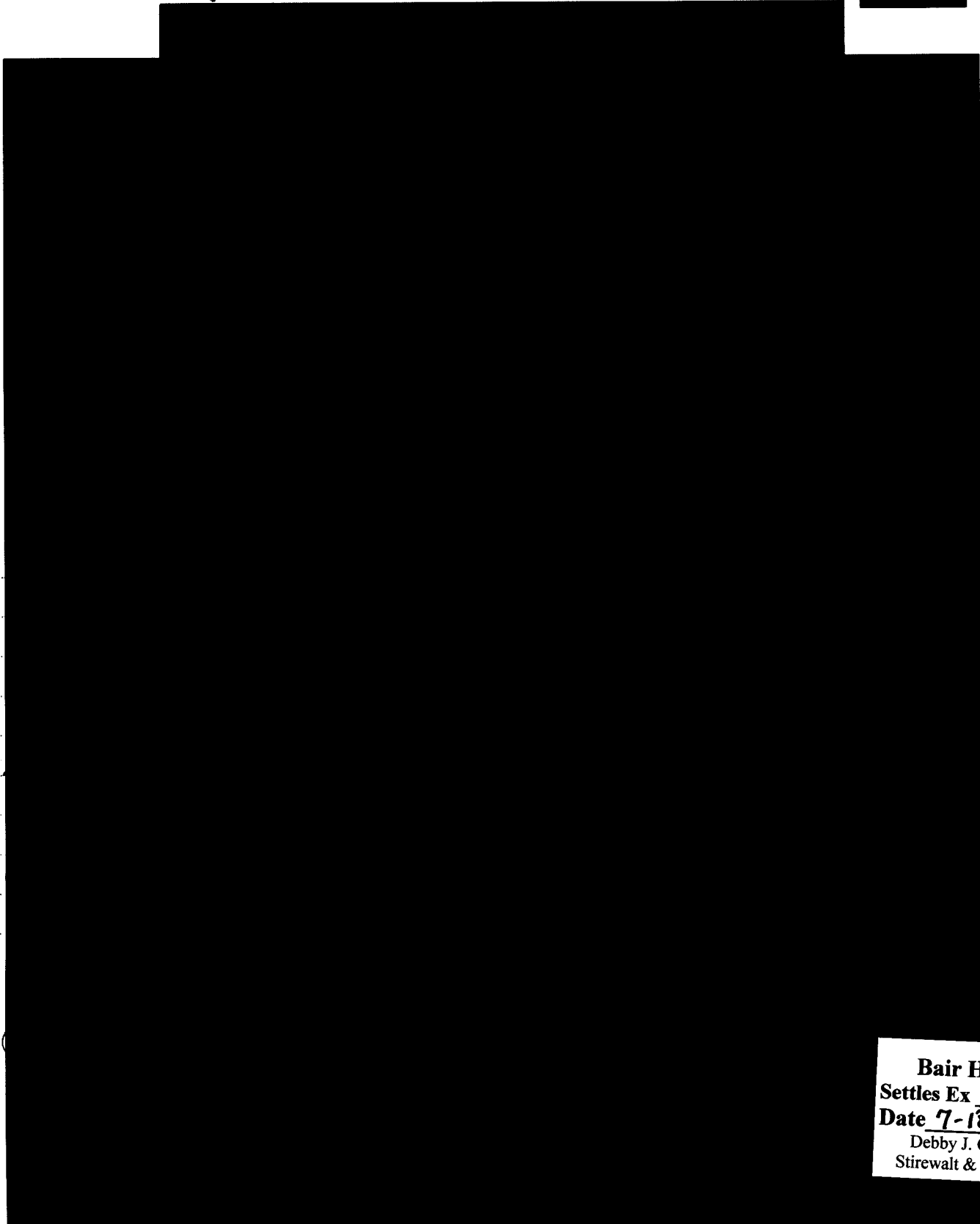
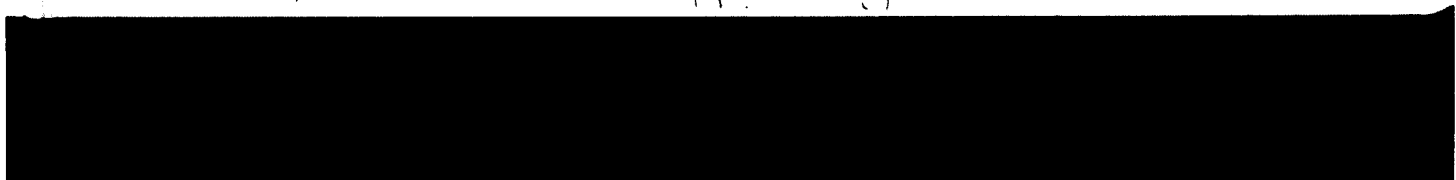


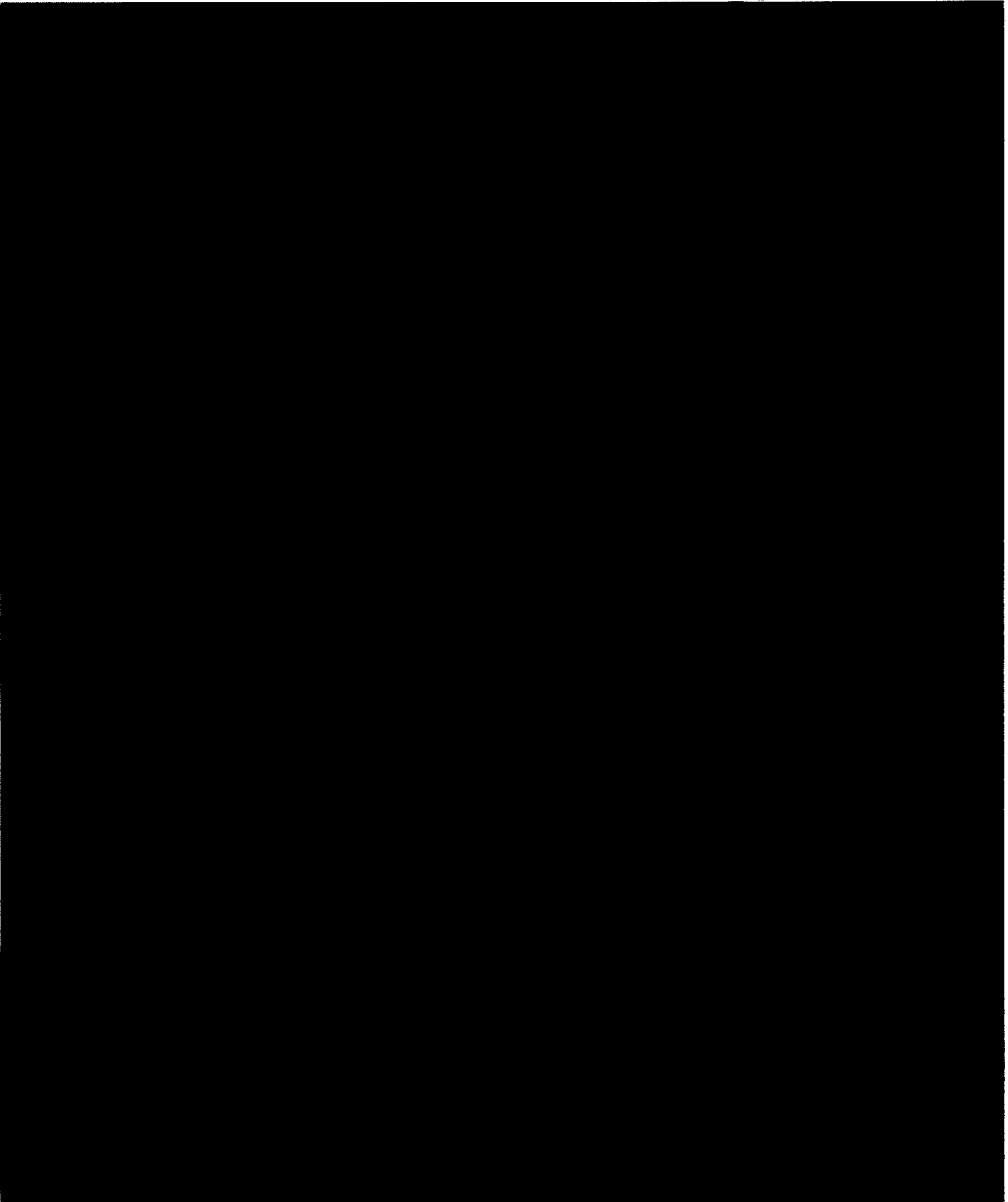
EXHIBIT 26

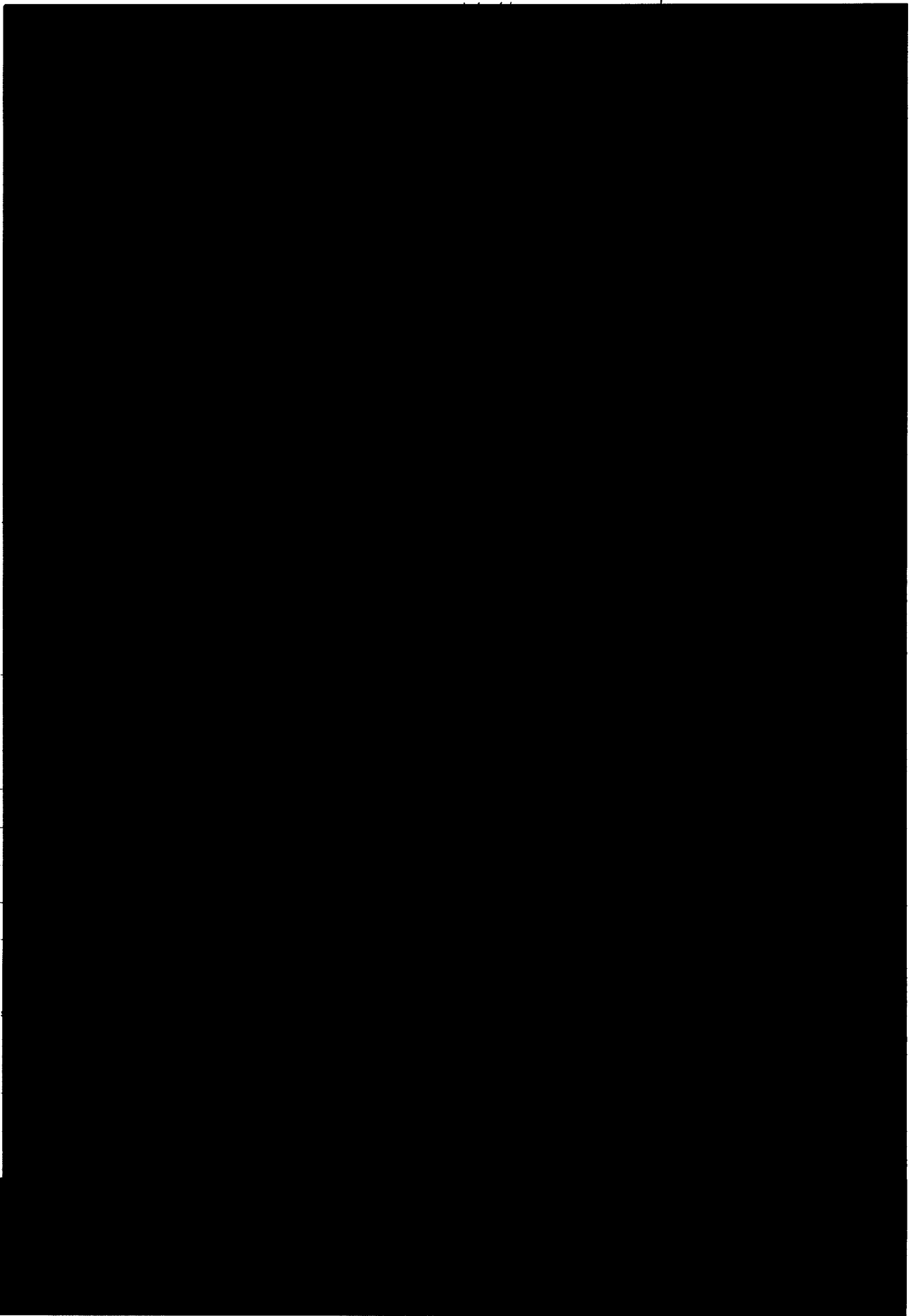
G.S. Settles Lab Notebook



Bair Hugger
Settles Ex 7
Date 7-18-17
Debby J. Campeau
Stirewalt & Associates







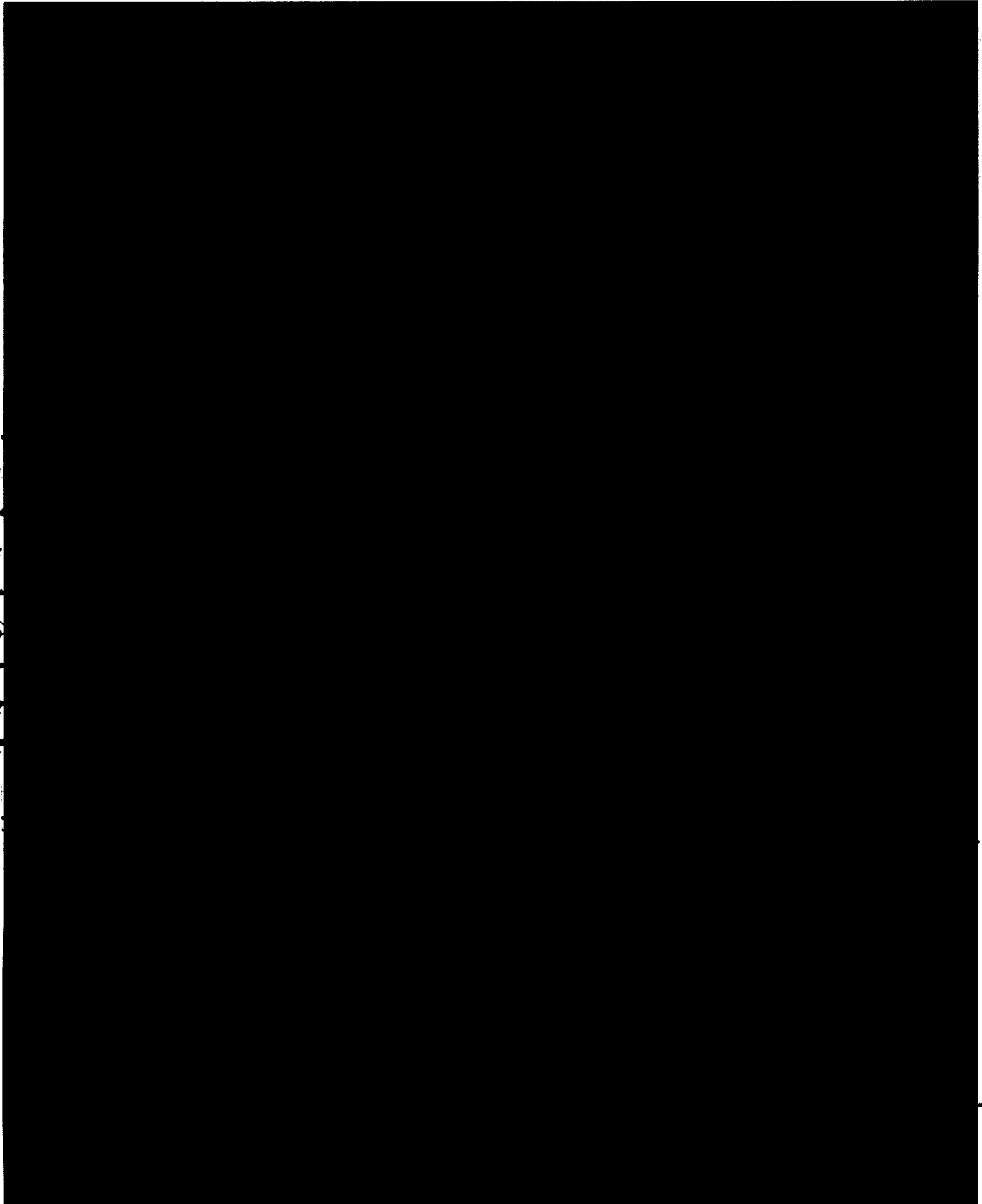
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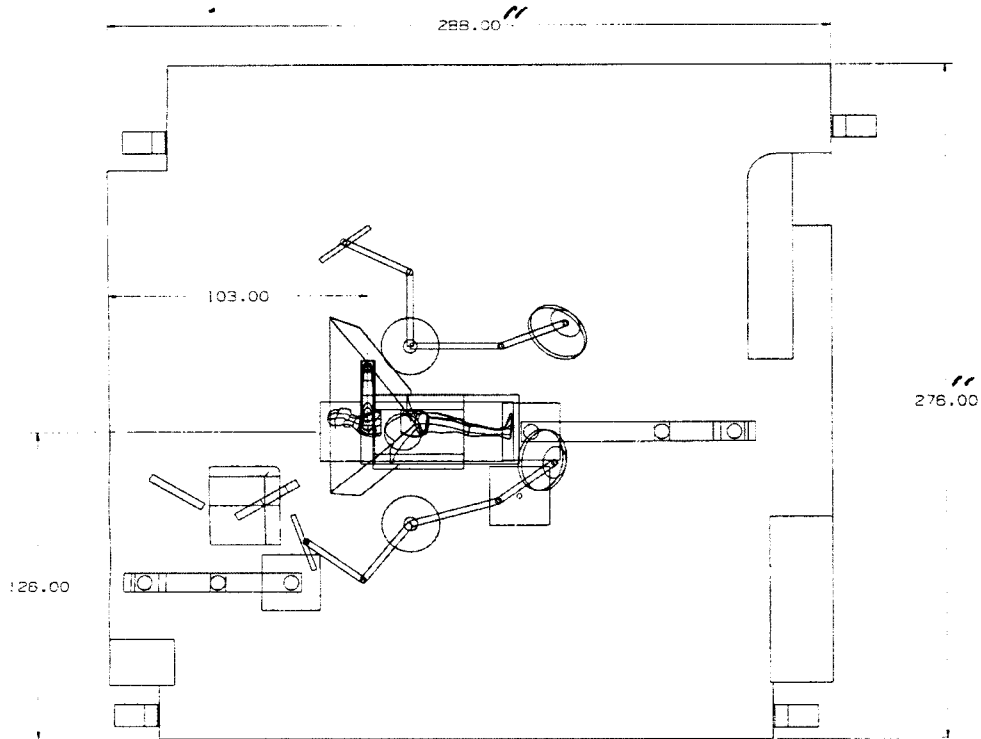
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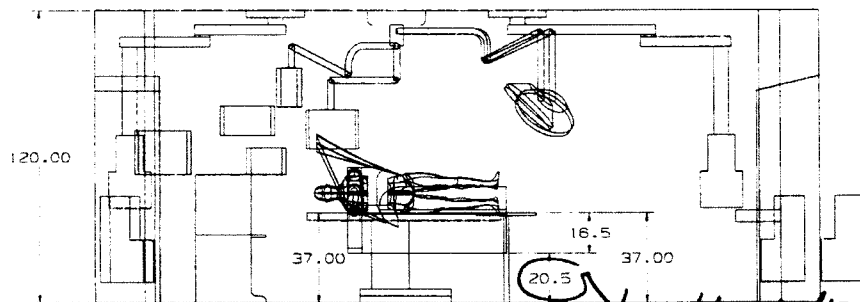
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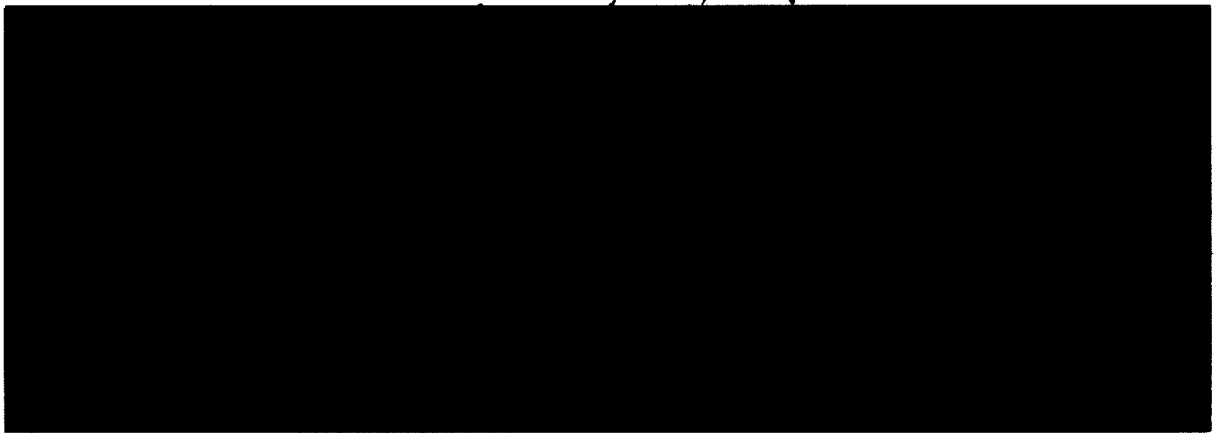




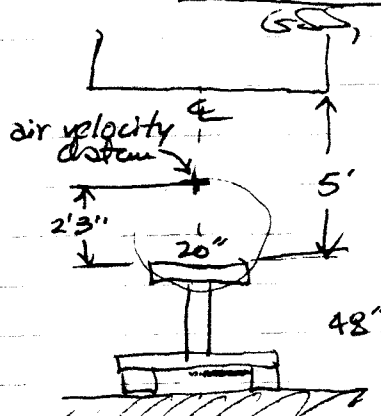
O.R. @ Fairview Southdale Hospital
(Minneapolis area)



height of table above floor



Initial Tests 18 April 2017

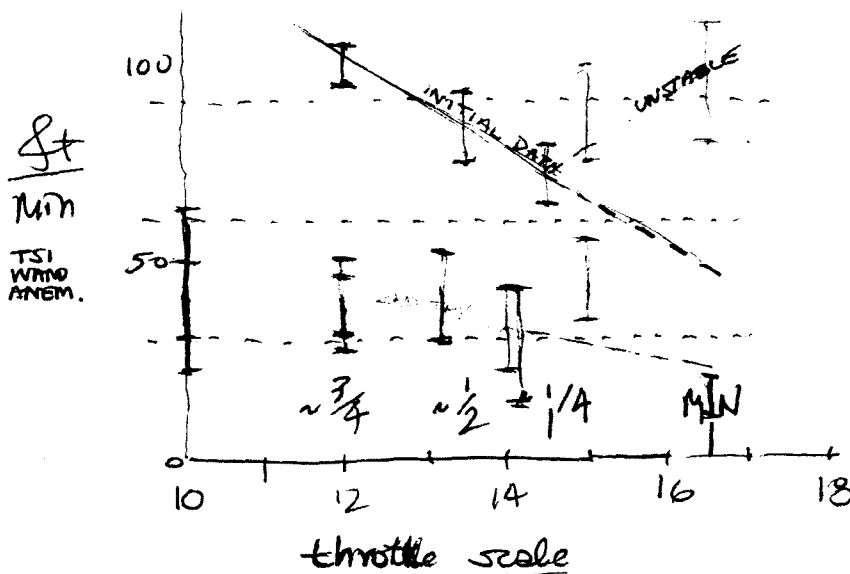


ft/min	throttle	
80-110	16.5	min.
65-80	14.15	1/4
78-94	13.15	1/2 throttle
97-104	12.0	3/4
75-100	15	

Upshot: flow is unstable at the lowest leaf-blower throttle setting (14.1 - 15 on scale), therefore unusable. Currently we can hit 30 ft/min and 70 ft/min. but not 60 and certainly not 30. We need to lower all velocities to the point where we can stably get 35, 60, & 90 fpm. (35 is the FSH value used in the J. Abraham CFD.)

19 April 2017

Added another layer of furnace filt inside downflow gm.

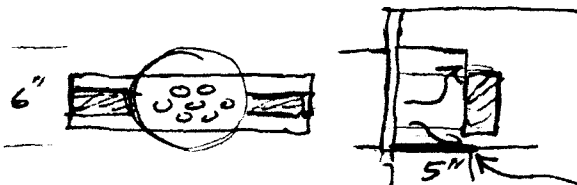


throttle	ft/min
17	6-8 ft/min
15	unstable
14 1/8	33 ± 10
13 1/8	0-41 ?
12	38 ± 10
full throttle 10	30-50

$$\frac{25 \text{ mi}}{\text{hr}} = \frac{5280'}{\text{mi}} \cdot \frac{\text{hr}}{60 \text{ min}} \cdot 25 = 2200 \text{ ft/min}$$

~~2200 ft/min~~ $\div 88 = 1 \text{ mph}$
(BAFFLE) installed inside of inlet to down-flow generator

throttle	fan
17	10-18
15	35-55
14 1/2	12-42
13 1/2	29-53
12	32-52
10	28-46



IMPT: Face Velocity of Low-inlet-Flow Ceiling
 Grilles in O.R.

- John Abraham's calculation for 3M used
 $\sim 34 \text{ ft/min}$
- S. Elghobzshi's CES calc. for Augustinus
 $\text{at } 0.1933 \text{ m/s} = 38 \text{ ft/min.}$
- \therefore There is no need for us to run 60 or 90
 ft/min. , but we should be measuring
face velocity

• Are we having this retrofit meeting?

Elghobzshi's Export Report:

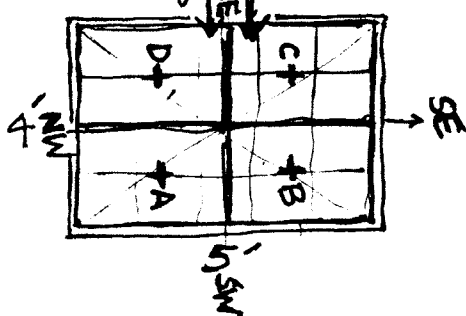
- The drape will block optical access
- CES 2 million CPU hours!
- rising thermal plumes are seen (Fig. 15b)
 from B-H air discharge from the ends
 of blanket/drape.
- Fig. 17: much of the thermal plume seems to
 to be coming from under the surgical table
 with B-H blower turned on.

(contd.)

- Elghobashi did not simulate the Hot Dog!
- Squamous motion from floor to opposite side;
we cannot simulate this, nor turbulence levels
- **Publication - quality!**
- "blower not so generated... Strong thermal plumes
and we have almost no time
"rising thermal plumes from the blower" ??
- The momentum of BH hot air jets from tiny orifices
is small & is directed downward. Thus for the
same heating rate, thermal convection eff of BH
& HD should be ~ the same
- No validation experiment exists

24 April 2017: **DOWNFLOW GENERATOR**

- Block is placed to interfere with jet observed
last week, hopefully even out downflow pattern.
- Measure face velocity, not center above
"piston"



	ft/min			
throttle	A	B	C	D
15	55-60	77-80	35	32
14 1/2	100	90	67	32
13 1/2				
12				
10				

April 27, 2017 (installed more filter over C & D)				
17	72	69	62	76
14 1/2	94	93	85	85
10 1/4	37	35	~17	~5

installed 1 more layer of filter overall

17	70	70	55	55
----	----	----	----	----

AVG	Gate valve	Gate valve installed			
44.5	1/4 closed	17	60	50	36
	1/2 closed	15	60	53	~10 un-stable
52	1/3	"	60	49	60
46	"	17	49	52	45

10



AVG	Gate Value	throttle	A	B	C	D
35	beta. 1/3 4 1/2	17	48	32	22	38
45	^{OPEN} split diff. 26w/c	"	50	51	36	42
41	marked "41"	"	54	30	31	48

chosen gassing condition
 DSC 435 44V no downflow
 hot coffee no downflow
 IMAGE & VIDEO LOG April 27, 2017

DSC-0045-46 stills, candle flame

DSC-0047 video candle flame (small FOV)

field of view ~ 24" wide (ignoring 3" each side)

DSC-0048

49, 50 stills with downflow ^{w/candle} (have chosen candr.)

51 10 sec video

52 " " JD's hand

53 " " " " NO downflow

54 HD Pet. using Sys. WCS1 @ 38°C

55, 56 stills

57, 58 HD underbody blanket stills

59 " " " video

60, 61 mammalian stop " " stills

62 " " " video

63, 64 " " " + Steri-Draps stills

65, 66 " " " " "

DOWNFLOW ON

67, 68 stills, 69 video

70, 71, 72 draps off, mammalian + HD

73, 74, 75 HD blanket ^{underbody} only

76, 77, 78, 79 HD WCS1 @ 38°C

80, 81, 82 vid " " " changed to Papc

83, 84, 85 vid BH 522 blanket upside down, jets up 33°C

86 - 88 " " " 1/2 of blanket folded under

89 - 91 BH 522 blanket right-side up

92 - 94 " " " with cotton blankets

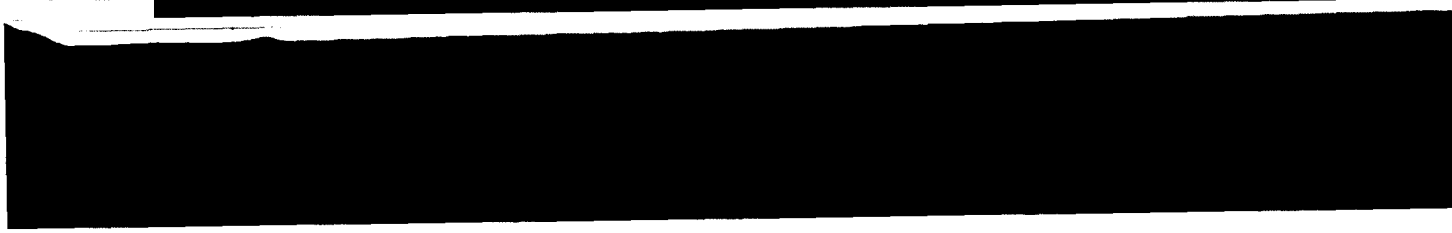
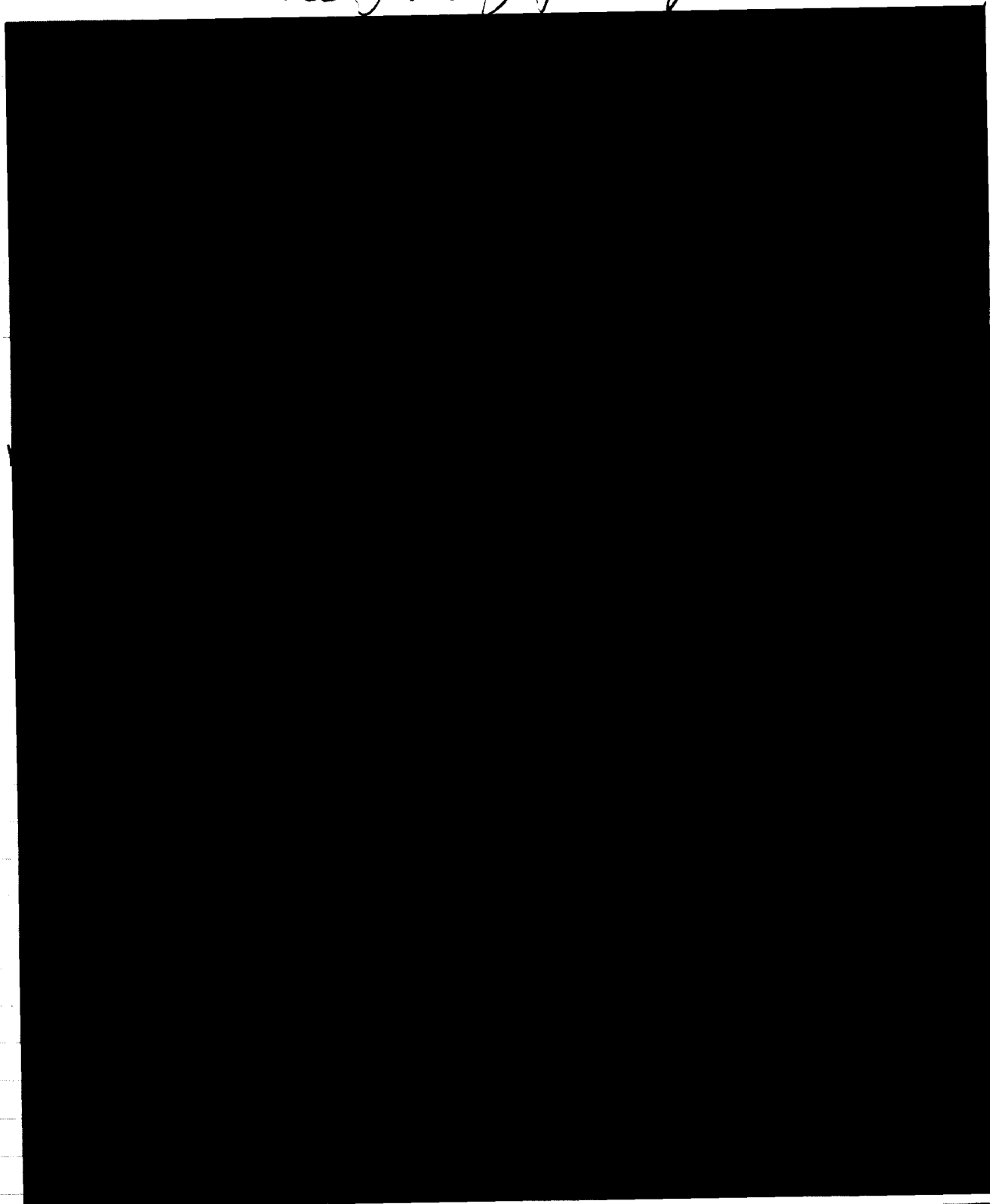
95 - 97 " DOWNFLOW ON " " "

(over)

NEED ~ 50mm outboard focusing lens + glasses

12

32-100 BT-22 bloodst right-side up 38°C, downflow
— end of testing for 27 Apr —

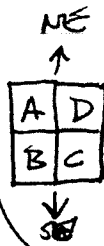


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[REDACTED]

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5 May 2017



Alt throttle	A	B	C	D
44.5 17	49	48	34	47

DOWNFLOW ON

(Still @ 2500 s)

white balance @ 5560K + PC1 lt. yell. filter
outboard f=100mm lens gives full

30" circle in FOV!

DSC-106 SHU, candle

107 video " "

108, 109 hand, still, video

110, 111 BH blower holes ^{at fan high} out, vert, still, video, 6" scale

112, 113 " " " "

(no obvious change seen w/ BH fan as high or low)

114, 115 BH blower horiz fan high, blower

Tamron lens does not work w/ this system: vignetting
even at min. (f/2.8). Back to outboard f=100mm

DSC-117 close-up BH jets ^{f=275mm} 11 6" scale NO DOWNFLOW

DOWNFLOW ON

118, 119 BH jets ↑ downflow on

120 calibration shot 6" scale

121-123 BH hose dump, no blower attached

124-126 NOT COVERED UNDER DFGON

127, 128 still, vid BH holes open centered under Dfgon

129, 130 cotton block on top of stove

Note: BH at high, vertical convection not suppressed
by downflow, but at low it is

131, 132 BH ^{FAN} on low

133, 134 BH " " , stop mannequin

135, 136 mannequin, looking along long axis of BH

137, 138 bare table (it's warm), downflow

Struggles to suppress it; mirror fogged

downflow apparently not useful due to stratification issue

DOWNFLOW OFF

ALL DOWNFLOW ON BECAUSE OF STRATIFICATION, PLUS REL HUMIDITY → 100% & MIRRORS FOGGED

(not centered under downflow gun)

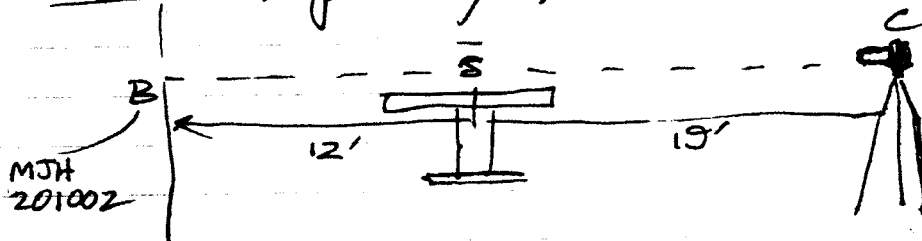
repeated
May 15

139, 40 BT blower unit (low) front lit
141, 142 " " (high fan) " 43°C
143, 44 " " on pole
145

Mirrors fogged up & downflow seemed impotent
∴ Quit for the day

5/11/17	AVG 39	THRU TITLE 17	A 54	B 44	C 31	D 27
---------	-----------	------------------	---------	---------	---------	---------

BOS Setup May 11, 2017 BSS



D50 V320s @ f/10 w/2 Bogen floodlights

V8C150 tore candle lit (no downflow)

✓151 JD's hand

✓152 B.H. tire

✓154 B.H. on 43°C high fan

✓155 H.D. tore underbody block

✓156 " 38°C " " 38°C

✓157 " " w/ Downflow Gen. (

moved camera to S to C = 12

✓158 " " " " " "

✓159 hand " "

✓160 candle " "

✓161 tore Downflow Gen. OF

✓162 hand

✓163 candle

Back to 30" Schlieren (May 11)

DSC-0164 test video of sensitivity w/ cleaned
mirrors & JD's hand ✓

0168, 169V B.H., mannequin, arms, blanket, ^{hip drape} full body drop
↓ (DOWNFLOW OFF) → Downflow ON AMS WORKING

170, 171 " " " "

172V, 173V, 174V, " " + JD "Dr"

175, 176 (refocused)

176V BH hose jet 177 still

178V hair dryer 179 still

180 HD on top of mannequin, 181V

182 + JD up to 185

186-195 JD garbed, breathing, NO BH or HD
stills & video

(stills 1/2000s
WB 5560 K)

14 May 2017 GSS Set up 4 1/4" schlieren
for closeups of BH exit jets.

DSC-0211a still & DSC-0210.2v: Show
about 1" or less of laminar jet followed
by rapid turbulent mix-out.

Flow is cool to the skin just inches
above BH blanket exit holes! Need T
profile & V profile, mass, Po also.

$$\frac{917 \text{ px}}{0.756''} = \frac{2531}{\text{dia F.O.V.}}$$

$$\boxed{\text{diameter of field-of-view} = 3.7''}$$

BH flow rate is not spec'd: have to measure it:
15 m/s over a 0.0445 m dia circle (BH discharging
ambient-temp air into Model 522 Upper Body Blanket)

$$Q = \frac{15 \text{ m}}{\text{s}} \left(\frac{\pi (0.0445)^2}{4} \right) = 0.0233 \text{ m}^3/\text{s} = 49 \text{ CFM (fan on high)}$$

USE THIS → (41.4 CFM used by J. Abraham)

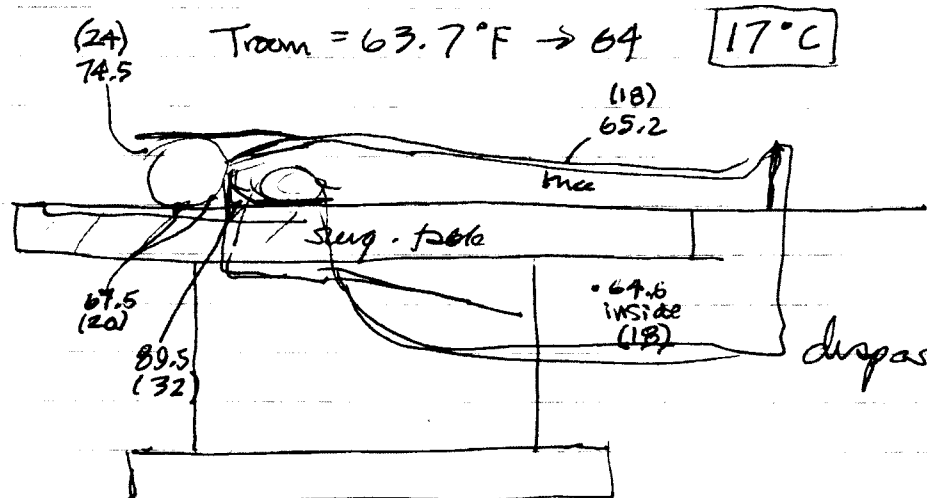
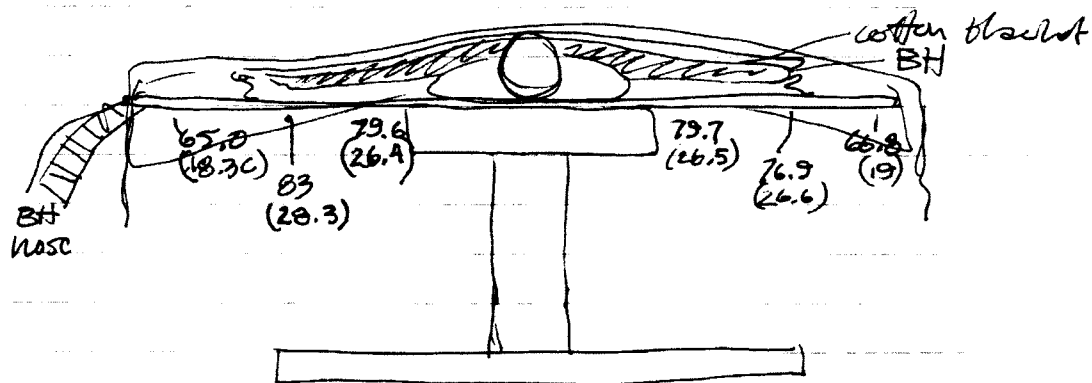
Compare Elghobashi's 1.1 m³/s = 2331 ft³/m (CFM)

✓ BH supply air is only ~ 1/56 of total downflow supply air
∴ how can it "destroy" the laminar flow "??"

18

May 15, 2017 Testing in Stormtown

Temp. measurements of outflow from under drapes with full mannequin, BH, blanket, drapes etc. & room temp. ~ 59°F (OR Temp.) This is to check Anesthesia/Ethobex outflow temp. card. of 41°C . BH sat at 49°C & high fan. Surgical area of drapes is knee



89 mm lens (outboard) replaces 100 mm ✓

1/2000s

Troom = 69°F WB color temp = 19

D-90 footage 15 May 2017 PCL yellow filter removed
(DOWNFLOW OFF)DSC- 227-229 still 230V BT 43°C fan high pur unit front
231-232s, 233V " " " side
(DOWNFLOW ON)

234, 235s, 236V " " " side

237, 238s, 239V " " " front

240, 241s 242V HD 38°C, 38°C paint unit " with pipe

→ 243, 244s 245V " " side with pipe
246, 247s 248V " " No pipe
249s, 250V

251, 252s, 253V

254, 255s, 256V

257V

downflow only
top top
hand
hot coffee

DSC-267, 268-5 269V electrocutionary NO DOWNFLOW
270, 271 272V DOWNFLOW

273, 274 = junk

275, 276s, 277V Anesthesia cart, BH 43° fan high No Downflow
278, 279s, 280V DOWNFLOW

281, 282s, 283 As above w/ JD garbed as Dr.

284, 285, 286 As in 278-80, but with BH on chair 10" down from top of table, contoured under top of manag. head

to Dropbox: 1) movie (2) 2) computer video 3) coffee video
4) 2 JD video from 1st Thurs. w/ caption
5) cassette 6) ~~from 1st Thurs.~~

Ymm T°C

~~2 34.2~~

0 33.1

5 22.0

8 26.0

21 26.7

40 23.5

52 23.0

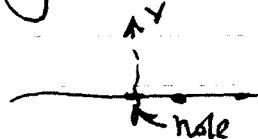
62 23.0

85 23.0

0 32.3

1 32.5

BH 43°C, fan on high
JSS 16 May 2017



Troom = 22°C

TSI Inc.
Air Velocity Meter
Model 9515

Pat
Ro
Sup
AC
Ro
Inle
Sup
Ro
Gri
Gri
Gri
Mex
Inle

May 18, 2017 Room = 69°F → 73°F
(Downflow ON)

DSC-0287V "Surg." Lamp + downflow
to 294 - 299 Still's

DSC-300V but not as good as 287V
Still's → 306V JD's head immediately under lamp
" 311V " " w/ cap & mask

Downflow generator off (Outside temp ~ 1°F >
indoor temp., ∴ downflow is subsat to buoyancy)
Relative temp. is an issue!
Still's → DSC-315 JD's phone
Still's → 320 " " sideways

JD's feet on raised platform
Still's & DSC329 Shuffling feet

Elghobashi

Table 1: Operating room characteristics

Parameter	Value
Room dimensions [m], L, W, H	7.115 × 7.00 × 3.175 ^{10.41}
Supply air flow rate [m ³ /s], \dot{V}	✓ 1.10436
ACH [1/hr]	(24.45)
Room air temperature [°C]	15
Inlet air density [kg/m ³], ρ_{in}	1.225
Supply air temperature [°C]	15
Room air pressure [Pa]	1.0131 × 10 ⁵
Grille dimensions [m]	1.12 × 0.51
Grille Area [m ²]	5.7 m ² = 0.5712 × 10
Grille hydraulic diameter [m], D_h	0.7
Mean inlet velocity [m/s], \bar{U}_{in}	38 ft/min 0.1933 ✓
Inlet Reynolds number, $Re_{in} = \frac{\rho_{in} \bar{U}_{in} D_h}{\mu}$	9226.54

END of LAB NOTEBOOK - JSS